

WHAT IS CLAIMED IS:

1. A self-emitting element comprising:
  - a light-emitting layer that is disposed between electrodes and that emits light upon applying a voltage between the electrodes;
  - 5 a protective layer that covers an emitting side of the light-emitting layer, forms an interface between the protective layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the light-emitting layer;
  - 10 a reflective layer that covers an opposite side, as viewed from the light-emitting layer, of the protective layer; and
  - an angle changer that is disposed at a periphery of the light-emitting layer, and changes a direction of the light propagating in the protective layer so that the light is incident on the interface at less
  - 15 than a critical angle.
2. The self-emitting element according to claim 1, wherein the reflective layer is one of the electrodes.
- 20 3. The self-emitting element according to claim 1, wherein the angle changer is a reflective surface that is inclined so that a space at the emitting side increases.
4. The self-emitting element according to claim 1, wherein the
- 25 angle changer is a refractive surface that is inclined so that a space at

the emitting side decreases.

5. The self-emitting element according to claim 1, further comprising a bank that projects on the emitting side to separate the  
5 light-emitting layer from other light-emitting layer; wherein an inner surface of the bank is the angle changer, and the protective layer is formed in an area that is enclosed with the bank.

6. The self-emitting element according to claim 1, further  
10 comprising:  
a bank that projects on the emitting side to separate the light-emitting layer from other light-emitting layer; and  
a protrusion, made of an insulating material, that projects toward the emitting side from the bank, wherein  
15 an inner surface of the protrusion is the angle changer, and the protective layer is formed in an area that is enclosed with the protrusion.

7. The self-emitting element according to claim 1, wherein the  
20 light-emitting layer is an organic electro-luminescent layer.

8. A display panel comprising:  
a plurality of light-emitting layers, each of the light-emitting layers being disposed between electrodes, and emitting light upon  
25 applying a voltage between the electrodes;

a protective layer that covers an emitting side of the light-emitting layers, forms an interface between the protective layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layers to undergo total reflection at least  
5 once at the interface in an area of the corresponding light-emitting layer;

a reflective layer that covers an opposite side, as viewed from the light-emitting layers, of the protective layer; and

a plurality of angle changers, each of the angle changer being  
10 disposed at a periphery of each of the light-emitting layers, that change direction of the light propagating in the protective layer so that the light is incident on the interface at less than a critical angle.

9. The display panel according to claim 8, further comprising a  
15 plurality of banks, each of the banks projecting on the emitting side to separate the light-emitting layers from each other, each of inner surfaces of the banks being each of the angle changers, and the protective layer being formed in an area that is enclosed with the each of the banks.

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10. The display panel according to claim 8, further comprising:  
a plurality of banks, each of the banks projecting on the emitting side to separate the light-emitting layers from each other, and  
a plurality of protrusions, each of the protrusions, made of an  
25 insulating material, projecting toward the emitting side from the each of

the banks, wherein

each of inner surfaces of the protrusions is each of the angle changers, and the protective layer is formed in an area that is enclosed with the each of the protrusions.

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11. A display apparatus comprising:

a display panel includes

a plurality of light-emitting layers, each of the light-emitting layers being disposed between electrodes and emitting light upon applying a voltage between the electrodes;

a protective layer that covers an emitting side of the light-emitting layers, forms an interface between the protective layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layers to undergo total reflection at least once at the interface in an area of the corresponding light-emitting layer;

a reflective layer that covers an opposite side, as viewed from each of the light-emitting layers, of the protective layer; and

a plurality of angle changer, each of the angle changer being disposed at a periphery of each of the light-emitting layers, that change direction of the light propagating in the protective layer so that the light is incident on the interface at less than a critical angle; and

a drive unit that drives the light-emitting layers of the display panel and displays an image.

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12. A method of manufacturing a self-emitting element, wherein the self-emitting element includes a light-emitting layer that is disposed between electrodes and that emits light upon applying a voltage between the electrodes; a protective layer that covers an emitting side  
5 of the light-emitting layer, forms an interface between the protective layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the corresponding light-emitting layer; a reflective layer that covers an opposite side, as viewed from the  
10 light-emitting layer, of the protective layer; and an angle changer that is disposed at a periphery of the light-emitting layer, and changes direction of the light propagating in the protective layer so that the light is incident on the interface at less than a critical angle, the method comprising:  
15 forming a bank, as the angle changer, that projects on the emitting side to separate the light-emitting layer from other light-emitting layer; and  
forming the protective layer in an area that is enclosed with the  
bank.

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13. A method of manufacturing a self-emitting element, wherein the self-emitting element includes a light-emitting layer that is disposed between electrodes and that emits light upon applying a voltage between the electrodes; a protective layer that covers an emitting side  
25 of the light-emitting layer, forms an interface between the protective

layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the corresponding light-emitting layer; a reflective layer that covers an opposite side, as viewed from the light-emitting layer, of the protective layer; and an angle changer that is disposed at a periphery of the light-emitting layer, and changes direction of the light propagating in the protective layer so that the light is incident on the interface at less than a critical angle, the method comprising:

forming a protrusion as the angle changer with an insulating material to separate the light-emitting layer from other light-emitting layer so that the protrusion is protruded from a bank that projects on the light-emitting side; and

forming the protective layer in an area that is enclosed with the protrusion.

14. A self-emitting element comprising:

a display layer that includes a light-emitting element; and

an output layer that is transparent, is disposed in an emitting

direction of the display layer, and includes an angle changer that changes a direction of light output from the light-emitting element to a direction of the emitting side, wherein

a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element.

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15. The self-emitting element according to claim 14, wherein the angle changer is any one of a micro lens, a micro prism, and a micro mirror.
- 5 16. The self-emitting element according to claim 14, wherein the display layer includes a transparent electrode layer, and the transparent electrode layer has a refractive index greater than that of the light-emitting element and sandwiches the light-emitting element.
- 10 17. The self-emitting element according to claim 16, further comprising an antireflective layer in an interface between the transparent electrode layer and the output layer.
18. The self-emitting element according to claim 14, further  
15 comprising a sealing layer that is transparent, and is disposed in an emitting direction of the output layer, wherein an inert gas that has a refractive index of almost one and is filled between the output layer and the sealing layer.
- 20 19. A display panel comprising a plurality of self-emitting elements that are arranged two-dimensionally in a matrix form, wherein each of the self-emitting elements includes  
a display layer that includes a light-emitting element; and  
an output layer that is transparent, is disposed in an emitting  
25 direction of the display layer, and includes an angle changer that

changes a direction of light output from the light-emitting element to a direction of the emitting side, wherein

a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element.

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20. A display apparatus comprising:

a display panel includes a plurality of self-emitting elements that are arranged two-dimensionally in a matrix form, wherein each of the self-emitting elements includes

10 a display layer that includes a light-emitting element; and  
an output layer that is transparent, is disposed in an emitting direction of the display layer, and includes an angle changer that changes a direction of light output from the light-emitting element to a direction of the emitting side, wherein

15 a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element; and

a drive unit that drives the display layer of the display panel and displays an image.

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21. A self-emitting element comprising:

a light-emitting layer that is disposed between electrodes and that emits light upon applying a voltage between the electrodes;

a protective layer that covers an emitting side of the  
25 light-emitting layer, forms an interface between the protective layer and



an external medium, and has a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the corresponding light-emitting layer;

5 a reflective layer that covers an opposite side, as viewed from the light-emitting layer, of the protective layer; and

an angle changer that is disposed at a periphery of the light-emitting layer, and changes a direction of the light propagating in the protective layer so that the light is incident on the interface at less than a critical angle, wherein

10 a refractive index of the protective layer is either almost the same as or greater than a refractive index of the light-emitting layer.